California MEDICINE

OFFICIAL JOURNAL OF THE CALIFORNIA MEDICAL ASSOCIATION

VOL. 65 OCTOBER, 1946 NO. 4

Human Reactions to Experimentally Induced Impact Forces*

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THIS paper applies to any field of medicine where the application of force causes injury. Current investigations in the Acceleration Unit at the Naval Medical Research Institute have implications which go beyond the bounds of aeronautics. Applications of these studies to many types of trauma are now evident. During the war, the problem of aircraft crashes was paramount, but because of circumstances it was a difficult problem to attack except from a preventive angle.

Within the past ten months studies of a fundamental nature have been undertaken on mechanical forces. These forces can be thought of as the etiologic agent of trauma. They have a definite structure just as bacteria or known viruses possess certain characteristics. A force can be described by its magnitude, duration, and pattern. A force even has an "incubation period" in that a certain time is required before its effects become clinically apparent. True, this incubation period is measured in milliseconds rather than days or weeks, but none-the-less it is a definite period. Forces, if large enough, may cause injury, or, if small, may be without physiological effect. They can be applied for long durations. Forces may be smoothly applied or may possess many irregularities or oscillations. The type of force greatly influences the sequence which follows, and a resistance to some types of forces can be developed. The treatment with which we are concerned is mainly that of prophylaxis, or alteration of the force so that the individual can tolerate a given amount of energy without injury. All these circumstances determine the effect of a given force upon the human.

It is known that some individuals have survived forces calculated to exceed 200 G.[5] These are usually referred to as "lucky" or "miraculous" escapes. But if one dares the damnation of superstition, it is evident that in the scientific world, luck or a miracle do not exist, per se. We feel that in such cases a peculiar train of physical events occur, rare to be sure, but none-the-less effective in permitting survival of an otherwise fatal accident.

One of the approaches to this problem has been to study these so-called lucky sequences with an ultimate goal of devising an apparatus or garment which can channel the force of a given acceleration into a preferred path and prevent injuries and fatalities.

It is reasonable to assume that the accelerations involved in aircraft crashes are not uniform. Therefore, in considering any procedure for protecting individuals from injury during such crashes, one must of necessity interpret the simple physical formulae for acceleration with caution.

One fact which stands out in crashes of military aircraft is that up to reasonably high forces (about 60 G), despite destruction of the wings, tail, under-carriage, and engine, the cockpit usually remains intact. (Fig. 1.) The fear of telescoping of the aircraft to crush the occupants, so common in the early days of aircraft construction, no longer exists in most military and a fair number of civilian aircraft. The aircraft industries have altered the pathogenesis of injury by more modern methods of construction so that personnel are now injured or killed in crashes by being flung about within an intact cabin or cockpit area. This factor is most evident in crashes aboard aircraft carriers where the entire sequence from before, during, and after a crash is followed by observers aboard the ship and can be photographed in slow motion. A study of these sequences has shown

* The information contained herein is that of the author and not necessarily the policies of the United States Navy.

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EDITORIALS

STREPTOMYCIN

The lack of availability heretofore of streptomycin has been a great disappointment to physicians whose patients seemed in urgent need of this new antibiotic; until less than a year ago the material could only be obtained by a few workers through highly specialized channels. Fortunately it was then possible to work out a mechanism whereby, under the supervision of the Committee on Therapeutics and Other Agents of the National Research Council, moderate amounts of streptomycin were distributed to a series of "responsible investigators" so that patients could be treated under controlled conditions and without cost in order to get a quick and reliable evaluation of what this antibiotic really accomplishes.

These investigators all reported the results of their studies to Dr. Chester Keefer, the Chairman of the Committee, and his report[1] of these pooled observations on 1000 patients represents a landmark in the study of streptomycin which every doctor should study with the greatest attention. Certain points seem definitely settled. First of all here is now a well-established list of the conditions in which streptomycin really is effective: Urinary tract infections due to various gram negative bacilli, bacteremias due to coliform bacilli and B. Friedlander, H. influenzae infections, tularemia, and meningitis due to coliform bacilli, B. Friedlander, B. Pyocyaneous and H. influenzae. On the other hand it now seems pretty clear that the material is of only questionable value in typhoid fever, Brucellosis and Salmonella infections. Malaria, Richettsial infections and virus infections seem not affected at all. The position of tuberculosis is not yet settled but streptomycin has been shown to exercise undoubted beneficial effects in certain experimental tuberculous infections and suggestive palliative results have been obtained in some cases of tuberculosis in man. Large amounts of this expensive material over long periods of time are necessary and much further study must be done; however, any ray of hope of effective therapy in tuberculosis is encouraging. More details as to indications can be found in the article by Dr. Keefer and his associates referred to above.

Quite recently streptomycin, with certain limitations, has been made available for all doctors—an event of the highest importance. The Civilian Production Administration has now undertaken —as it did with penicillin several years ago—to allocate a monthly allowance of streptomycin to civilian "depot" hospitals which in turn can distribute the material to doctors on proper request. Thirteen hospitals, for example, have been designated in San Francisco and the same number in Los Angeles, as well as hospitals in many other cities in California. When a doctor has a patient who needs streptomycin he will apply to the nearest depot hospital. The hospital in turn, since the supplies are as yet very limited, will probably request information showing that the case is a suitable one for streptomycin treatment. Streptomycin unfortunately is still quite expensive but it is to be hoped that prices will fall and supplies increase in the near future.

It is hard to avoid comparisons between streptomycin and penicillin and it must be admitted that penicillin still stands out on the whole as the more valuable agent. The conditions in which streptomycin is effective are unfortunately limited in number and some of the most brilliant results are had in diseases so rare—such as tularemia—as to constitute no great problem. Unpleasant and sometimes serious reactions—skin rashes, fever, constitutional symptoms and auditory nerve disturbances—frequently limit the time over which streptomycin can be given to a few days; there is also a tendency for many bacteria to become rapidly resistant to the drug. None the less, streptomycin has clearly come to stay and will be, if not a competitor, at least a valu-

CALIFORNIA MEDICAL ASSOCIATION

NOTICES AND REPORTS

California Physicians' Service—Record-Keeping

California Physicians' Service had an enrollment of 272,440 beneficiary members as of September 1 this year an increase of more than 115,000 during the past 12 months. Enrollment figures for September are not yet available as this is written, but at the present rate membership will exceed 300 000 within two months and should be approaching the half million mark within the next six to eight months.

Interest shown by the general public in the C.P.S. prepaid medical care program is gratifying to the board of trustees and the administration. It is felt that the quickened interest is the result of several factors, salient among them being the splendid public relations program being carried by the California Medical Association. Most important of all is that the medical profession of California is demonstrating to the public that it is sincerely and efficiently providing a prepaid medical service plan to people in the lower income brackets.

The rapid increase in C.P.S. membership has presented many problems to the administration, which has been handicapped by lack of trained personnel and office space. These handicaps are being overcome as rapidly as possible. Experience shows that rapid enrollment always is followed by a high percentage of utilization of the surgical contract for the first few months. This necessitates constant and careful study by the medical department to keep C.P.S. policies on a sound actuarial basis. In this important department C.P.S. has 66 employees in Los Angeles and 51 in San Francisco handling the commercial and veterans' programs.

Probably only a few physicians realize the important role the medical department plays in keeping C.P.S. on an even keel.

Each day thousands of punch cards speed through the IBM machines. From the carded cryptics comes a report on the activity of thousands of physicians . . . a report on the thousands of beneficiary members of C.P.S. . . . a report on the cost of, say, Case No. 549.

Did you know that some 10.500 beneficiary members each month are under the care of physicians scattered throughout the State of California? That out of every 1,000 members 30 to 35 will seek treatment in physicians' offices each month? That there will be approximately two and one-half bills per patient?

Our machine records tell us this. And more. That over 25 000 bills per month must be individually priced and coded.

C.P.S. has long since learned that there is a general pattern of the practice of medicine in this state which is almost mathematically predictable. For this reason, it has abandoned the time-worn procedure that characterizes other medical service plans, where an initial report must be submitted and authorization be granted to perform certain procedures for certain types of illnesses.

Under the C.P.S. procedure, the patient's identification card is an immediate authorization for treatment. It is only necessary for the physician to submit to C.P.S. at the end of each month his bill for the services rendered.

When this bill is received in the C.P.S. offices it is checked with what is known as the "Positive Identification Section." This section has listed all the members and their status. The lists show whether or not their dues have been paid and the type of contracts that they hold. After the eligibility has been determined, a case that has never had service under C.P.S. becomes a patient, and a medical folder is made up in which the present treatment and all future treatments will be filed together. If the patient has been under care previously, his medical record is pulled from the file and the case is studied in relation to the medical care that has been rendered.

The bills are then sent to the Medical Department, where they are priced according to the C.P.S. Fee Schedule. At this point the cases are carefully studied to determine benefits—whether or not the chronic condition clause has run out, whether or not the patient has had one year's care for a particular illness, and many other factors that relate to the contract provisions. After this has been determined, each individual case ends up in a series of code numbers. Before each pricer there is an abbreviated diagnostic code of some 1,000 items. This code was taken from the United States Public Health Morbidity Code, and was specifically designed for use in prepaid medical care plans. It has only been developed since 1940. Thus each illness that is being seen ends up with a code number. For instance, appendicitis becomes No. 549. If it happens to be a perforation of the appendix, it becomes No. 540.

For each case of illness a case number is assigned, so that all costs relative to the particular case may be gathered together and eventually C.P.S. may determine the cost per case. The cost per case may involve the surgeon's services, an assistant and anesthetist, certain laboratory work; and for hospitalization will include so many days in the hospital, plus operating room costs.

After these facts are determined, one further step is developed, to determine just what has been done to care for any particular illness. Thus, if an appendectomy had been performed for appendicitis, the code number 222 would be assigned, and for the assistant's services there would be the code number 194. Any other services that were performed would be assigned the proper procedure number.

CHANGES IN MEMBERSHIP

New Members (15)

Alameda County (1)

Shanley, F. Dunning, *San Francisco*

Fresno County (2)

Davidson, Bernice F., *Fresno*
Kazato, Henry H., *Fresno*

Kern County (2)

Hong, Charles J., *Bakersfield*
Matt, Wayland P., *Bakersfield*

Marin County (2)

Pike, Catherine C., *San Rafael*
Russell, Carroll, *San Rafael*

Orange County (3)

Maxwell, Milton, *Corona Del Mar*
Ryan, E. J., *Tustin*
Treadwell, W. V., *Santa Ana*

San Francisco County (1)

Spencer, James A., *San Francisco*

San Mateo County (1)

Alter, Frank W., *San Mateo*

Solano County (2)

Jantzen, C. J., *Vallejo*
Orr, Joseph K., *Vallejo*

Sonoma County (1)

Dick, Noble, *Santa Rosa*

Transfers (7)

Cooley, Fred E., from *Tulare County* to *Fresno County*
Dudley, Seymour, from *Los Angeles County* to *Alameda County*
Havenhill, A. D., from *Santa Cruz County* to *Fresno County*
Maher, Edward Joseph, from *Santa Clara County* to *San Luis Obispo County*
Rupp, J. J., from *Santa Barbara County* to *Ventura County*
Swartout, Hubert C., from *San Bernardino County* to *San Luis Obispo County*
Tavares, Clement, from *San Francisco County* to *Fresno County*

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ANTISPASMODICS

I don't know what kind of a love-maker Director Lucky Humberstone is off the set, but he's a stickler for details in this scene. He makes Maureen and Cornel repeat the action and the dialogue over and over again. At last he's satisfied and Cornel gets up off the bed rubbing the back of his head.

"This love scene is giving me a stiff neck," he says.—*From Harrison Carrol's movie column in the San Francisco Call-Bulletin.*

Sounds like a bad dislocation.

Parts of a dismembered body, carefully packed in two paper cartons and a milk can, were found last night in an alley behind the Paramount Theatre on Market Street. . . .

Deputy Coroner William Under, who arrived on the scene in response to a police call, said, "this is certainly a murder."—*From a news story in the San Francisco Examiner.*

Pretty hard to fool even a *deputy* coroner.

TRICKED

On looking through my husband's copy of the September issue of Medical Economics, I saw in the index an article which gave promise of great things—"New Tricks for Old Bags." I turned with eager anticipation to page 66 to find merely suggestions for refitting and arranging of medical kits.—*Submitted by K.R.M.*

Superficial examination indicated the victim had been a large person. It was not at once possible to determine the sex. The head was missing.—*From the San Francisco Examiner.*

Head, that is.

OR COUNT TEN

When a young woman shipyard worker was brought to the infirmary with a lower back injury, the nurse who prepared her for examination watched her husk out of a suit of coveralls, a pair of corduroys, then a pair of jeans, and finally her panties. Asked why she was so fulsomely clothed, the young woman replied, "It gives a girl a chance to reconsider."—*Submitted by F.R.E.*

HEROINIC COUPLET

The vitamin and hormone aren't any kin.
One can hear a hormone, but not a vitamin.
—*Submitted by B.E.*

CHANGES IN MEMBERSHIP RETIRED MEMBERS

(Continued from Page 16)

Retired Members (4)

Carter, William E., *San Francisco County*
Dozier, Earnest, *Shasta County*
LeBaron, Robert O., *Mendocino-Lake County*
Weiskotten, William O., *San Diego County*

Associate Members (5)

Cordua, Olive B., *San Diego County*
Foster, Harry E., *Alameda County*
Hume, Portia Bell, *Alameda County*
Lesem, A. M., *San Diego County*

PENICILLIN BRINGS SPEEDY RECOVERY IN SKULL INFECTIONS

Penicillin offers the patient suffering from infections involving the central nervous system and skull the most effective and rapid way to recovery, according to five San Francisco investigators.

Writing in the August 10 issue of *The Journal of the American Medical Association,* H. C. Naffziger, M.D., Helen Warmer, A. B., Walter E. Stern, M.D., Roberta Fenlon, M.D., and H. J. McCorkle, M.D., from the Division of Surgery of the University of California Medical School, say that during the past two years they gave penicillin to 37 patients with infections involving the central nervous system and skull.

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PENICILLIN BRINGS SPEEDY RECOVERY IN SKULL INFECTIONS

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Treatment consisted of penicillin injections into the muscles at three hour intervals, lasting anywhere from six to 114 days. The total dosage of penicillin varied from 745,000 units for those patients with infections of the skull bones but no central nervous system involvement to 36,500,000 units for patients who had signs indicating localized areas of infection within the skull.

The authors say that the response to penicillin treatment was very good in nearly all cases, often referring to the results as "excellent."

The article points out that "in three patients with pneumococcic meningitis definite localizing signs were observed indicating intracranial abscesses originating from acute mastoiditis. Although the surgeons declined to operate on these three patients because of their critical, apparently hopeless condition, all three recovered after prolonged penicillin therapy."

DOCTORS ADVOCATE MANAGEMENT, LABOR FIGHT ON TUBERCULOSIS

Both management and labor are in an "enviable position" to fight tuberculosis today, according to Drs. Norvin C. Kiefer and Herman E. Hilleboe, surgeon and medical director, respectively, of the U. S. Public Health Service, Washington, D. C.

In an article appearing in the September 21 issue of *The Journal of the American Medical Association* the two health officials estimate that there is a national deficit of approximately 40,000 beds for tuberculous patients.

"Unquestionably," they say, "part of this shortage is a result of scarcity of building materials and labor but a large part comes from lack of comprehension of the magnitude of the problem and lack of social consciousness of the rights and needs of the unfortunate victims of the disease."

Management, Labor Can Combat Deficiencies

Drs. Kiefer and Hilleboe believe that management and labor can "combat these deficiencies" because "they have political influence, financial power and social prestige.

"The frequently wide divergence of their separate philosophies usually is ample evidence to the general public of the unselfishness of any projects in which the two cooperate equally," *The Journal* article says, adding: "The disease is of paramount importance to both of them because in the years of greatest wage earning capacity tuberculosis as a cause of death surpasses all other diseases. Tuberculosis therefore results in a serious loss of manpower in this country every year, and this loss must be borne by both employer and employee.

Industry Can Encourage More Hospitals

"Industry can encourage, even demand, enlarged hospital facilities. Furthermore, industrial concerns and labor unions are in a position to make substantial financial contributions, contributions which will yield large dividends in the form of saving of human suffering, misery and death. At least until an adequate number of beds in tuberculosis hospitals are available immediately to patients needing them, general hospitals could provide emergency or temporary care for the tuberculous until such a time as they can be transferred to the institutions specializing in the care of the tuberculous."

The authors estimate that "from January, 1942, to the present time over 2,000,000 people have had chest x-ray examinations by units of the U. S. Public Health Service in cooperation with state and local health organizations. During the same period the armed forces, industry and state and local health departments and tuberculosis associations have examined over 25,000,000 persons. The great majority of these people have been in the age group 15 to 65 years. These are the years of greatest industrial productivity.

"Of the persons examined by the U. S. Public Health Service 1.2 per cent have shown evidence of reinfection tuberculosis. In other words, in the people who are wage earners or potential wage earners approximately 24,000 cases of reinfection tuberculosis were discovered.

"Of equal significance is the distribution of these cases according to the classification of the National Tuberculosis Association," the two doctors state. "Roughly 70 per cent of this total number were minimal cases, 25 per cent moderately advanced and 5 per cent far advanced. The full importance of this ratio can be better appreciated when it is remembered that, by contrast, admissions to tuberculosis hospitals have consisted of only 10 per cent of minimal cases, about 30 per cent of moderately advanced cases and 60 per cent of far advanced cases. Thus routine preemployment chest x-rays and mass

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DOCTORS ADVOCATE MANAGEMENT, LABOR FIGHT ON TUBERCULOSIS

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chest x-ray surveys have resulted in an almost complete reversal of the previous ratio between minimal and far advanced cases. Moreover, the effective utilization of mass radiography also discovers pathologic conditions in the chest other than tuberculosis and consequently is of invaluable aid to the medical profession in general."

A number of studies indicate that the tuberculous ex-patient is a satisfactory employee; therefore, the authors feel that it does not seem unfair to expect an employer to reinstate any former employee who has recovered sufficiently from tuberculosis. "This statement remains true even when, at first, the ex-patient and ex-employee is able to start at only four hours' work per day and may have to be placed at work which is more suitable to his physical limitations. Even these disadvantages may be more than compensated by the broadening of the scope of activities of the Office of Vocational Rehabilitation. Many of these employees, as a result of insanatorium and early postsanatorium instruction and training, will return to their jobs better qualified and more productive than they were before the onset of the disease."

Employment of Recovered Patients Urged

In addition to this, the authors add, "a further necessity will be that of cooperation of industry in a general program of employment of all tuberculous ex-patients. Some of the younger patients will have developed tuberculosis before they ever had a job; others will have

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DOCTORS ADVOCATE MANAGEMENT, LABOR FIGHT ON TUBERCULOSIS

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worked in plants where all of the jobs involve physical exertion to an extent which is unsafe for these people. Labor and management must cooperate in offering suitable work placement for these persons even when they are not former employees.

"It may be argued that to acknowledge such obligations is to grant special privileges to those who have recovered from tuberculosis. But is the victim of the disease the only person who gains from such an arrangement? If this person is unemployed, our social code does not permit us to allow him to starve to death, although too frequently this nearly happens. He and his family must be supported by public money—and this money is raised by taxation. In the meantime however this same person dependent on charity, with little self respect, with resentment toward society, with an environment conducive to repeated breakdowns, presents a constant threat of attacks of tuberculosis to himself, to his family and to every one with whom he may come in contact. There are, therefore, strong and purely selfish reasons why management and labor should be prepared to make actual sacrifices in order to give these people any necessary privileges in obtaining jobs."

TYPHOID PATIENTS RESPOND TO THERAPY WITH BACTERIOPHAGE

Five California physicians reduced the death rate to 5 per cent among a group of 56 typhoid patients who were treated with a virus-like agent known as bacteriophage, according to an article in the September 21 issue of *The Journal of the American Medical Association.*

The physicians are Evelynne G. Knouf, of South Pasadena, Walter E. Ward, of Los Angeles, Paul A. Reichle, Los Angeles, A. G. Bower, Pasadena, and Paul M. Hamilton, San Marino.

The authors state that bacteriophage, considered a parasite of bacteria, has been used for the past ten years in the treatment of patients with typhoid fever in the Communicable Disease Unit of the Los Angeles County General Hospital, with which they are associated.

It is pointed out that the results with these patients were so spectacular because a specific type of bacteriophage was used for each patient. The number of bacteriophages is legion, the article says, but each differs in its ability to attack certain types of bacteria. Each patients was given the specific phage which would attack his own organisms.

The following results were immediately noted: (1) negative blood cultures 24 hours after treatment, (2) absence of fever, (3) immediate clinical improvement.

"One of the most spectacular objective accomplishments of this form of treatment," the doctors write, "was the rapidity with which the patient returned to his normal mental outlook. Within 24 to 48 hours after bacteriophage therapy, the patient who had been comatose and in the 'typhoid state' or who had demonstrated the characteristic whining, querulous, obstreperous manner amazed everyone by his cheerful, grateful, cooperative attitude. A state of well-being existed. Also, patients whose anorexia before treatment was so great as to make forced feedings necessary, afterward usually asked for food, weakly at first and later vociferously."

Typhoid fever bacilli are spread by faulty sewerage and contaminated water or through infected persons by fingers, food and flies. Once the typhoid bacilli enter through the mouth they pass on through the stomach, enter the upper intestines, and set up an inflammation of the intestinal walls. They invade the lymph nodes, where they multiply rapidly, and then they enter the blood stream. The death rate for many years has remained around 10 per cent.

The specific bacteriophage in a dextrose solution was administered by injecting it into the veins over a period of four to seven hours. This was usually followed by a moderate chill lasting approximately 30 minutes. After the chill the doctors noted that the temperature began to mount and reached a peak of 105 to 107 F. within three to six hours. The temperature returned to normal within nine and one-half to 24 hours after treatment was started and in most instances remained normal thereafter.

In a discussion which accompanied the article, Dr. Wilton L. Halverson of San Francisco states: "The spectacular nature of the recovery of these patients is something we don't forget when we see the patient go through the episode. . . . I believe this is a contribution which will be of great importance to us in typhoid."

Medical Films Available for Component County Medical Societies of C.M.A.

The Committee on Postgraduate Activities of the California Medical Association recently purchased 17 medical films. List of titles and time to run appears below.

Letters giving information concerning procedure for use of these films have been sent to the presidents and secretaries of all C.M.A. county societies.

Requests for films should be sent to C.M.A. Postgraduate Committee, 450 Sutter Street, Room 2009, San Francisco (8).

All films are "silents," that is, with explanatory legends. (Note. These films were made prior to World War I. Additional comment by discussants may be indicated, in order to bring information up to date.)

Filing Number of Film	*Title of Film*	*Running Time Single Film*	*Total Time for Sequence*
1	Acute Appendicitis (Professional) Reel I	15 Min.	2 Reels 31 Min.
2	Acute Appendicitis (Professional) Reel II	16 Min.	
3	Benign Prostatic Hypertrophy	17 Min.	
4	Cardiac Irregularities—Reel I	17 Min.	2 Reels 34 Min.
5	Cardiac Irregularities—Reel II	17 Min.	
6	Infections of the Hand—Reel I	17 Min.	3 Reels 48 Min.
7	Infections of the Hand—Reel II	17 Min.	
8	Infections of the Hand—Reel III	14 Min.	
9	Indirect Inguinal Hernia—Reel I	16 Min.	3 Reels 41 Min.
10	Indirect Inguinal Hernia—Reel II	10 Min.	
11	Indirect Inguinal Hernia—Reel III	15 Min.	
12	Intestinal Peristalsis	16 Min.	
13	Normal Heart	10 Min.	
14	Rabies	8 Min.	
15	Simple Goiter	17 Min.	
16	Treatment of Normal Breech Presentation—Reel I	15 Min.	2 Reels 29 Min.
17	Treatment of Normal Breech Presentation—Reel II	14 Min.	

BOARD OF MEDICAL EXAMINERS

By FREDERICK N. SCATENA, M.D.

Secretary-Treasurer

Board Proceedings

A regular meeting of the Board of Medical Examiners was held at the Biltmore Hotel, in Los Angeles, August 5 to 8, 1946.

Written examinations were conducted and hearings were held on petitions for restoration of revoked certificates, as well as on disciplinary matters.

The following actions were taken by the Board after a regular hearing:

William Everts Downing, M.D.—License suspended for one year, to be followed by five years' probation without narcotics, and additional terms.

William T. Engleman, M.D.—License revoked.

James A. Moran, M.D.—License suspended for one year, to be followed by five years' probation without narcotics, and additional terms.

Eugene Curry Nelson, M.D.—License restored and he was placed on probation for a period of five years with specified terms.

Gottfried Karl F. Schnarrenberger, M.D.—License suspended for six months, to be followed by five years' probation with specified terms.

Lee Smith, M.D.—License restored and he was placed on probation for five years without narcotics and additional specified terms.

John Jerome Tobinski, M.D.—License restored and he was placed on probation with specified terms.

Isaiah J. Waterman, M.D.—License restored and he was placed on probation with specified terms.

The next meeting of the Board of Medical Examiners will be held in Sacramento, October 21 to 24, inclusive.

The Board has given considerable thought and consideration to graduates of foreign medical schools, and as it has become impractical, if not impossible, to investigate or secure detailed reports of the type and quality of instruction given in such schools the Board, at the August meeting, passed the following rule:

"Applicants, including those applying for reciprocity upon a license from another state, a certificate issued by the National Board of Medical Examiners, or a commission as a medical officer in the United States Army, Navy, or Public Health Service upon graduation from foreign schools, whose resident professional instruction has been secured in teaching institutions located outside the United States and Canada and whose credentials are found sufficient in form by the Credentials Committee and the Board, and the information available is found insufficient to adequately determine the sufficiency and quality of the applicant's resident professional instruction shall be given and shall successfully take a written, oral and clinical examination suitable and sufficient to indicate the quality and sufficiency of his resident professional instruction."

This rule has the effect of eliminating direct reciprocity for graduates of foreign medical schools, as it provides that applicants whose credentials are acceptable will have to take a written, oral, and clinical examination, re-

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BOARD OF MEDICAL EXAMINERS

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gardless of whether they hold a license obtained by written examination in another state dated less than ten years prior to the filing of the application in the Board office.

The Board, at the recent meeting, extended the scope of investigation regarding applicants for restoration of revoked certificates or modification or termination of probation. These applicants, in addition to filing the information required in Section 2375.5 of the Business and Professions Code, will be required to show complete rehabilitation and to what extent they have kept themselves abreast of the current advances in medicine and surgery.

HYPERTENSIVE PATIENTS MUST BE RELIEVED OF FEAR AND ANXIETY

"One of every three deaths would be postponed, years of worry, economic dependence and illness would be remitted if arterial hypertension and its related diseases could be abolished," according to an article in the current issue of *Hygeia,* health magazine of the American Medical Association.

The authors—Irvine H. Page, M.D., associate member of the Rockefeller Institute and director of research for the Cleveland Clinic Foundation, and A. C. Corcoran, M.D., a staff member of the Rockefeller Institute Hospital who specializes in the physiology and pathology of high blood pressure and kidney disease—state that as yet the causes of this condition are still unknown. However,

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HYPERTENSIVE PATIENTS MUST BE RELIEVED OF FEAR AND ANXIETY

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it has been recognized that hypertension occurs in the course of such diseases as Bright's disease, inflammation of the kidney and tumors of the adrenal glands.

The problem of arterial hypertension has two major facets, the first being the removal of the cause of increased pressure and the other the arrest and prevention of vessel damage. Drs. Page and Corcoran believe that one observation in animals has greatly stimulated research on this problem. "This was the demonstration that partial clamping of the artery which nourishes the kidney results in a persistent increase of arterial pressure that mimics the arterial hypertension of human beings. This clamping sets up a disturbance in the flow of blood through the kidney which stimulates the liberation from it of a substance called renin. Renin interacts in the blood with another substance to liberate a third compound, angiotonin. Angiotonin or something chemically like it, then contracts the arterioles and increases the heart's effort. The result of its action is a sustained elevation of arterial pressure. Some evidence indicates that long-established experimental hypertension of this sort causes arteriolar damage of the type which may develop in human beings.

"This accounts for the hypertension that may complicate certain types of kidney disease. It may also be the cause of some of the increase in pressure in patients with arterial hypertension whose kidney vessels are damaged. Damage to the arterioles of the kidney, although

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HYPERTENSIVE PATIENTS MUST BE RELIEVED OF FEAR AND ANXIETY

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common in established and severe hypertension, is not found in the early and mild forms of the disease. It is still rather unlikely that we have accounted for the first elevations of arterial pressure in human beings."

There are certain general measures that can be taken to relieve hypertension. Among these are the avoidance of unpleasant emotions such as fear, anger or anxiety which may temporarily increase arterial pressure; moderation in diet and, in the presence of obesity, deliberate, slow reduction of body weight to a level preferably a little less than normal for the patient's height and age.

Operations are performed for the relief of arterial hypertension. They consist in severing many of the nerves which stimulate blood vessels.

King George III (1738-1820).—Though George III was a manic-depressive, the king who lost the American colonies was withal a dutiful, forthright ruler of great personal courage. As a matter of fact, by leading a less conscientious political life, he might never have tasted the indignity of straight-jacket. On one occasion he placated rioting weavers, angry at the non-passage of a protective silk tariff, only to be tormented later by the thought that military action should have been taken against them.—Warner's *Calendar of Medical History.*

PROBLEM OF IMPAIRED HEARING RESTS ON TREATMENT AND CURE

Emphasis in the problem of impaired hearing should be placed on treatment and cure rather than on prevention, according to A. C. Furstenberg, M.D., of Ann Arbor, Mich.

Writing in the September 21 issue of *The Journal of the American Medical Association,* Dr. Furstenberg states: "I have never been convinced of the truth of the often published statement that 75 to 80 per cent of all cases of impaired hearing are preventable, and that this large proportion of its victims could have avoided their affliction had it been identified early and had proper methods of prevention been instituted. How can one prevent a degeneration of the auditory nerves which often occurs as the result of severe toxic diseases? . . . How are physicians to keep the eustachian tubes of children in working order and the middle ears free from infection during the course of diseases which infect the upper respiratory tract, particularly measles, scarlet fever, mumps and whooping cough?"

World War II saw the first practical adoption of a program for the treatment of deafness. "I point with pride and with a deep sense of gratitude," the author writes, "to those far sighted and efficient representatives of the Army and Navy who created an epochal program of service by the establishment and efficient operation of four centers for the rehabilitation of the hard of hearing in military service. These important units located at strategic points in the United States, Deshon General Hospital at Butler, Pa.; Borden General Hospital at Chickasha, Okla.; Hoff General Hospital in Santa Barbara, Calif., and the U. S. Naval Hospital at Philadelphia, have done a colossal job and have achieved memorable progress in the care of the hard of hearing that will not fail to attain lasting recognition.

"The pioneers in this field wisely combined all available talents—those of the otologist, psychiatrist, psychologist, physicist, electrical and acoustic engineers and speech experts to function in an integrated and cooperative program that has rendered service of inestimable value to the unfortunate persons whose hearing was impaired in the line of duty.

"It remains now for civilian physicians and for public health and welfare agencies interested in this field to become familiar with the yeoman service of these great centers and to establish several more along similar lines, geographically located to render the greatest possible service to the people of this country. Unfortunately, progress in civic agencies is frequently slow, but the impetus given this magnificent program of service to the hard of hearing by military personnel is destined to inspire, if not demand, a similar plan of action in civilian life."

Barush Spinoza (1623-1677).—The skilled lens grinder, Baruch Spinoza, was frail and tuberculous, but his philosophy has had an enormous influence upon modern thought. Breathing glass dust by day, pouring nightly over his books, always closely confined, dieting in the hope of curing his illness, the constitution of Spinoza was soon worn down as surely and completely as the lens he ground by day. Death came before anyone realized how seriously ill he had been.—Warner's *Calendar of Medical History.*

BERIBERI HEART DISEASE TEST OFFERED AFTER 5 YEAR STUDY

Four physicians who made a five year study of beriberi (a vitamin deficiency) heart disease at the Cincinnati General Hospital offer a new set of standards to aid in differentiating it from other types of heart disease which it closely resembles.

Writing in the June 29 issue of *The Journal of the American Medical Association,* the doctors—M. A. Blankenhorn, C. F. Vilter, I. M. Scheinker, and R. S. Austin, from the Departments of Internal Medicine, Neuropathology and Pathology, University of Cincinnati College of Medicine—recommend applying the following test:

(1) There must be insufficient evidence for any other cause; (2) a thiamine (vitamin B_1) deficient diet must have existed for three or more months; (3) signs of nerve inflammation or of pellagra, another vitamin deficiency disease, must be present; (4) detection of an enlarged heart with normal heart rhythm; (5) presence of swelling; (6) high blood pressure; (7) minor electrocardiographic changes and (8) recovery with decrease in heart size or autopsy consistent with beriberi heart disease.

Beriberi is usually caused by a thiamine deficiency in the diet. It is prevalent chiefly in Japan, India, China, the Philippines and the Malay Peninsula. The disease is marked by spasmodic rigidity of the lower limbs, with a wasting of muscular tissue, paralysis, anemia and neuralgic pains.

During the five year study which the doctors began in 1940, they were able to recognize 12 cases of beriberi

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BERIBERI HEART DISEASE TEST OFFERED AFTER 5 YEAR STUDY

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heart disease which conformed to the eight-point criteria which they recommend. Because the disease was first recognized in its late stages, five of the patients died in the hospital while one died after returning home. Rest and injections of large doses of thiamine were the mode of treatment.

Dietary deficiency, which was found in 11 patients, was directly ascribable to alcoholism, according to the article. "The majority of the diets, as far as assessment was possible, were deficient not only in thiamine but also in the other water soluble vitamins, particularly niacin, riboflavin [both portions of vitamin B complex] and ascorbic acid [vitamin C]. One patient, though an alcoholic addict, had apparently been eating amounts of the essential nutrients which under normal conditions would have been adequate. This person, however, proved to absorb many substances poorly. In every instance the patient had been existing on a diet deficient in thiamine for longer than three months."

In all 12 patients there was other evidence of nutritive failure, state the authors. Always there was some indication that the nerves near the surface of the skin were inflamed or that pellagra was present. In half of the patients both disorders were found. Eight of the 12 patients had anemia; nine were found to have an abnormally decreased amount of portein in their blood plasma. In addition, x-rays revealed an enlarged heart in 10 of the patients.

Marcel Proust (1871-1922).—Incurably asthmatic and a profound neuropath, Marcel Proust hovered constantly on the borderline of life. A chronic invalid at thirty-five, he forsook the social life of which he was so fond to devote himself entirely to his writings. Though perhaps less abnormal than Dostoievski, he is comparable to him as a psychological novelist. He could not tolerate the slightest noise or cold. To those who knew him, his air-tight, cork-lined habitat and his heavy pelisse, were legendary.—Warner's *Calendar of Medical History.*

Robert Hooke (1635-1703).—An experimental philosopher and mechanical genius, one of Hooke's many inventions was a rather complicated compound microscope. He is regarded as the greatest English microscopist. His "Micrographia" (1665) contains a first description of the biologic cells, illustrated with 83 plates of figures, and is said to have helped to inspire Nehemiah Grew's studies on the microscopic structure of plants.—Warner's *Calendar of Medical History.*